CONSIDERATIONS ON THE EPIDEMIOLOGY, ETIOLOGY AND PROFILE OF PERIODONTAL - DENTAL INJURIES IN PRESCHOOL POPULATION IN IĂŞI COUNTY

R. Cioăta¹², Carmen Savin², Maria Vataman³ A. Maxim², Adriana Bălan²

University of Medicine and Pharmacy „Grigore T. Popa” – Iaşi
Faculty of Dental Medicine
1. Ph.D. student
2. Discipline of Pedodontics
3. Discipline of Endodontics

CONSIDERATIONS ON THE EPIDEMIOLOGY, ETIOLOGY AND PROFILE OF PERIODONTAL-DENTAL INJURIES IN PRESCHOOL POPULATION IN IĂŞI COUNTY (Abstract): In recent years there has been a considerable increase in the number of temporary teeth injuries, this variability being determined by multiple etiologic factors, which we need to be aware of, as well as by predisposing conditions. **Aim:** To characterize the epidemiology, etiology and pathology of specific types of periodontal-dental trauma in a series of preschool children from Iaşi County. **Material and methods:** The study included a total of 672 subjects aged 3 to 7 years old, from both urban and rural areas of Iaşi County. Statistical analysis was performed using STATISTICA software used in medical research. **Results:** Prevalence of periodontal-dental trauma in the study group was 19.64%. Gender distribution in the study group showed a preponderance of males (62.12%). The risk of periodontal-dental trauma in deciduous teeth was 1.63 times higher in boys compared to girls. Fall accidents (41.67%) closely followed by playground accidents (31.82%) were the most common causes of periodontal-dental trauma in the study group. **Conclusions:** The prevalence of temporary dental trauma in the study group was relatively high, requiring the implementation of oral health promotion strategies and prevention programs, primarily addressed to parents and educators. **Keywords:** PERIODONTAL-DENTAL TRAUMA, TEMPORARY TEETH, PREVALENCE, ETIOLOGY.

Oral and facial traumatic pathology in children is a complex issue with a great impact on cervico-facial and psycho-somatic harmony, its epidemiological, clinical, therapeutic and developmental features differing from traumatic injuries in adults.

Data in the literature on the prevalence of periodontal dental trauma vary considerably from study to study. This large variability could be accounted for by a combination of factors such as trauma classification, type of studied dentition, or differences in geographical area, socio-cultural, and behavioral patterns of the studied groups (1).

In recent years there has been a considerable increase in the number of temporary teeth injuries, this variability being determined by multiple etiologic and predisposing factors which we need to be aware of.
and that require preventive, curative and
interceptive measures (1).

This paper aims to determine the epi-
demiological profile, etiology and specific
lesions of dental periodontal traumas in a
preschool population of Iasi County.

MATERIAL AND METHODS
The study group included a total of 672
subjects selected of the 729 targeted chi-
ldren aged 3 to 7 years old, from urban and
rural areas of Iasi County, who have been
examined in the Iasi Pediatric Dentistry

Children were examined by specialist
dentists who have previously participated
in a calibration process to minimize poten-
tial inaccuracies of diagnosis and classifi-
cation of traumatic lesions; thus, the classi-
fication proposed by Andreasen et al. (1)
has been used.

Children legal guardians were informed
about this research through oral present-
ations by the research team. All legal guar-
dians were asked to fill-in a questionnaire
including demographic data, circumstances
of injury, and provided an agreement to
enroll their child/children in the research.
Also, a written informed consent was ob-
tained.

Criteria for inclusion in the study were:
age (3 to 7 years), obtaining informed con-
sent from parents or legal guardians, ab-
sence of severe anterior teeth caries. Exclu-
sion criteria were: refusal to provide in-
formed consent, lack of child cooperation,
erection of permanent incisors.

The approval of the Ethics Committee
of the "Grigore T. Popa" University of
Medicine and Pharmacy - Iasi and Iasi
School Inspectorate were as obtained.

For statistical data processing we used
STATISTICA software. Specific tests
(ANOVA, Pearson Chi - square (χ²),
Spearman, Gamma) were used and the
parameters of interest were analyzed. Thus
p, the calculated reference indicator, re-
lected the level of significance of the tests,
was compared with p = 0.05 corresponding
to a 95% confidence interval (CI) with a
significant value for p <0. 05.

RESULTS
Prevalence of periodontal dental trauma
in the study group was 19.64%.

Sex distribution of our patients was
homogeneous (52.53% boys, 47.47% girls).
When analyzing the sex distribution of
injured children, a predominance of boys
(62.12%) was found. This is supported by
the nonparametric correlation Chi-
square test, which indicates a moderate association
between boys and presence of trauma (χ² =
6.06, r = -0.438 p = 0.0137, 95% CI).

The risk for dental periodontal trauma
in deciduous teeth for boys was 1.63 times
higher than for girls (Odds Ratio = 1.63,
minimum = 1.08, maximum = 2.45, 95 %
CI). Prospectively, by calculating hazard
ratio (the relative risk (RR)), it came out
that boys have a 1.48 times higher risk of
periodontal dental trauma (RR = 1.48, mini-
imum = 1.08, maximum = 2.04, 95% CI).
The rural/urban distributions of child-
ren with dental trauma revealed a higher prev-
alence (61.36%) of traumas in urban areas,
and a moderate statistical association be-
tween the two parameters (tab. I).

Risk of periodontal dental trauma in ur-
ban children (calculated by contingency
table) was significantly higher than in rural
children. The calculated odds ratio was
2.12 (minimum = 1.41, maximum = 3.20,
95% CI) and the risk ratio (RR) was esti-
mated at 1.83 (minimum = 1.34, maximum
= 2.51, 95% CI).
TABLE I
Parameters estimated in testing the association of periodontal dental trauma in temporary teeth vs. area of origin

<table>
<thead>
<tr>
<th></th>
<th>df=1</th>
<th>Chi-square $\chi^2$</th>
<th>P 95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-square - $\chi^2$</td>
<td>14.73144</td>
<td>0.00012</td>
<td></td>
</tr>
<tr>
<td>M-L Chi-square</td>
<td>14.75281</td>
<td>0.00012</td>
<td></td>
</tr>
<tr>
<td>Correlation Coefficient (Gamma)</td>
<td>-0.359902</td>
<td>0.00012</td>
<td></td>
</tr>
</tbody>
</table>

As to the etiology of periodontal dental trauma in temporary teeth in our study group, fall accidents (41.67%) ranked first, closely followed by playground accidents (31.82%).

Dental lesion profile in our patients was dominated by subluxations (26.52%), enamel fracture and intrusion, identified in 23.48% and 18.18% of cases, respectively. In significantly lower percentages other types of lesions were recorded: enamel and dentin fracture (9.09%), contusion (8.33%), lateral luxation (6.82%), penetrating fracture (4.55%) and avulsion (3.03%).

The mean age of injured children was 53.4 months ± 11.13 DS.

The relationship between dental-periodontal injury pattern correlation and mean age of children reflected a correlation of dental avulsions with the highest mean age (65.50 ± 12.56 DS), and of the penetrating fractures with the lowest mean age (42.67 ± 7.42 DS) (tab. II).

TABLE II
Age-related indicators for the type of periodontal dental trauma in temporary teeth

<table>
<thead>
<tr>
<th>Type of trauma</th>
<th>Mean age (months)</th>
<th>Mean -95%</th>
<th>Mean -95%</th>
<th>Std. Dev.*</th>
<th>Std. Er. †</th>
<th>Min‡</th>
<th>Max^</th>
<th>Q25§</th>
<th>Median</th>
<th>Q75</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enamel fracture</td>
<td>55.00</td>
<td>51.04</td>
<td>58.96</td>
<td>10.80</td>
<td>1.94</td>
<td>36.00</td>
<td>65.00</td>
<td>49.00</td>
<td>62.00</td>
<td>63.00</td>
</tr>
<tr>
<td>Enamel and dentin fracture</td>
<td>61.17</td>
<td>56.44</td>
<td>65.90</td>
<td>7.44</td>
<td>2.15</td>
<td>52.00</td>
<td>68.00</td>
<td>53.00</td>
<td>66.00</td>
<td>68.00</td>
</tr>
<tr>
<td>Enamel, dentin and pulp fracture</td>
<td>42.67</td>
<td>34.88</td>
<td>50.45</td>
<td>7.42</td>
<td>3.03</td>
<td>37.00</td>
<td>54.00</td>
<td>37.00</td>
<td>39.00</td>
<td>50.00</td>
</tr>
<tr>
<td>Subluxation</td>
<td>50.23</td>
<td>46.11</td>
<td>54.35</td>
<td>12.00</td>
<td>2.03</td>
<td>37.00</td>
<td>75.00</td>
<td>39.00</td>
<td>50.00</td>
<td>56.00</td>
</tr>
<tr>
<td>Lateral luxation</td>
<td>47.67</td>
<td>41.70</td>
<td>53.63</td>
<td>7.76</td>
<td>2.59</td>
<td>39.00</td>
<td>57.00</td>
<td>42.00</td>
<td>42.00</td>
<td>56.00</td>
</tr>
<tr>
<td>Intrusion</td>
<td>53.71</td>
<td>49.93</td>
<td>57.49</td>
<td>8.96</td>
<td>1.83</td>
<td>43.00</td>
<td>70.00</td>
<td>45.50</td>
<td>55.00</td>
<td>58.00</td>
</tr>
<tr>
<td>Avulsion</td>
<td>65.50</td>
<td>45.52</td>
<td>85.48</td>
<td>12.56</td>
<td>6.28</td>
<td>47.00</td>
<td>75.00</td>
<td>58.50</td>
<td>70.00</td>
<td>72.50</td>
</tr>
<tr>
<td>Contusion</td>
<td>56.00</td>
<td>48.19</td>
<td>63.81</td>
<td>11.62</td>
<td>3.50</td>
<td>46.00</td>
<td>76.00</td>
<td>47.00</td>
<td>48.00</td>
<td>70.00</td>
</tr>
<tr>
<td>Total Groups</td>
<td>53.40</td>
<td>51.48</td>
<td>55.32</td>
<td>11.13</td>
<td>0.97</td>
<td>36.00</td>
<td>76.00</td>
<td>44.50</td>
<td>53.50</td>
<td>63.00</td>
</tr>
</tbody>
</table>

Anova Test: p=0.00115

*Standard Deviation; †Standard Error; ‡Minimum; ^Maximum; §Quartiles.
Considerations on the epidemiology, etiology and profile of periodontal- dental injuries

The analysis of lesional types according to the cause of trauma revealed that playground accidents mostly resulted in enamel fractures. Periodontal-dental trauma due to falls has most frequent resulted in lateral luxation, complicated fractures and subluxations, while bicycle accidents in intrusions and avulsions (fig. 1).

Fig.1. Temporary teeth dental-periodontal trauma etiology vs. type of injury

DISCUSSION

The prevalence of temporary teeth periodontal-dental trauma varies greatly in the literature. Thus, in Brazil (2, 3) it ranges between 9.4% and 41.6%, while in the US (4) it reaches 23.00% compared with 18% in Belgium (5). It should however be noted that many of these studies report the prevalence of different age groups (1), from preschool environments, both public and private, with or without socioeconomic differences, so they are unlikely to be comparable. As mentioned, this study was conducted on a age-limit population, and the traumatic events occurring before the age of 3 years, when there is an increased risk of dental injuries, were not recorded.

The 19.64% prevalence of traumatic injuries in temporary dentition found in our study group is close to that reported by Carvalho (5). This value can be close to the real one, but our study group being a small one it may not be representative for the entire pediatric population in the area of interest.

Although recent studies (4, 6) show that the distribution of periodontal dental trauma in temporary dentition is less influenced by sex, some authors (7) report that there is a higher frequency of occurrence in boys, as supported by the present research, which revealed a moderate association between trauma and boys.

The main etiological factor of periodontal-dental traumatic accidents in our study was falls, as found in most studies (5, 8, 9). Especially in younger age groups, poor motor coordination, specific curiosity and carelessness, may make children to perform tasks at high risk of trauma.

Data of various studies on periodontal dental injuries are difficult to compare due to the different classification criteria found in the literature; nevertheless, coronal fractures, simple or penetrating, are often reported as lesions with the highest prevalence by many authors (10, 11, 12). On the other hand, there are a significant number of studies which concluded that dental
luxation proved to be the most common type of injuries seen in primary dentition (13, 14). In our study subluxations and enamel fractures are the most common injuries. These differences can be accounted for by variations in study group selection, screening method, and researchers.

CONCLUSIONS
Prevalence of temporary teeth periodontal – dental trauma in our study group was relatively high (19.64%), requiring the implementation of strategies aimed at promoting oral health and prevention programs for parents and educators. To establish a more accurate profile of pediatric periodontal-dental trauma in our region and for their correct management, all medical and social institutions of interest in the field should become involved.

REFERENCES